

Name: _____

PC: Systems of Three Inequalities

Date: _____

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Do Now

1. Sketch the graph of the solution set including the vertices:

$$y + x < 0$$

$$x^2 + y^2 < 9$$

Examples:

For each of the following, sketch the graph (and label vertices) of the solution set of the system.

1. $x - y < 2$
 $x > -2$
 $y \leq 3$

5. $4x + y \leq 8$
 $x - y \leq -2$
 $x \geq 0$

2. $3x + 2y < 6$
 $x > 0$
 $y > 0$

6. $x > 0$
 $y > 0$
 $x + y < 10$
 $x^2 + y^2 > 9$

3. $2x^2 + y \geq 2$
 $x \leq 2$
 $y \leq 1$

7. $y < x + 6$
 $3x + 2y \geq 12$
 $x - 2y \leq 2$

4. $x \geq 1$
 $x - 2y \leq 3$
 $3x + 2y \geq 9$
 $x + y \leq 6$

Practice Exercises

For each of the following, sketch the graph (and label vertices) of the solution set of the system.

1.
$$\begin{aligned} x &\geq 0 \\ y &\geq 0 \\ 3x + 5y &\leq 15 \\ 3x + 2y &\leq 9 \end{aligned}$$

5.
$$\begin{aligned} x^2 + y^2 &< 9 \\ x + y &> 0 \\ x &\geq 0 \end{aligned}$$

9.
$$\begin{aligned} x &\geq 0 \\ y &\geq 0 \\ y &\leq 4 \\ 2x + y &\leq 8 \end{aligned}$$

2.
$$\begin{aligned} x^2 + y^2 &< 9 \\ x + y &> 0 \\ x &\leq 0 \end{aligned}$$

6.
$$\begin{aligned} y &\geq x^3 \\ y &\leq 2x + 4 \\ x + y &\geq 0 \end{aligned}$$

10.
$$\begin{aligned} y &> x + 1 \\ x + 2y &\leq 12 \\ x + 1 &> 0 \end{aligned}$$

3.
$$\begin{aligned} x + y &> 12 \\ y &< \frac{1}{2}x - 6 \\ 3x + y &< 6 \end{aligned}$$

7.
$$\begin{aligned} x + 2y &\leq 14 \\ 3x - y &\geq 0 \\ x - y &\geq 2 \end{aligned}$$

4.
$$\begin{aligned} x^2 - y &\geq 0 \\ x + y &< 6 \\ x - y &< 6 \end{aligned}$$

8.
$$\begin{aligned} x &\geq 0 \\ y &\geq 0 \\ x &\leq 5 \\ x + y &\leq 7 \end{aligned}$$